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USSR Report

AGRICULTURE

(FOUO 8/82)

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TILLING AND CROPPING TECHNOLOGY

USE OF AIRCRAFT IN AGROCHEMICAL WORK

Ashkhabad SEL'SKOYE KHOZYAYSTVO TURKMENISTANA in Russian No 10, Oct 81 p 31

[Article by V. M. Kurilo: "In the Service of the Harvest"]

[Text] Agricultural aviation has become a constituent part of the program being implemented by the party for extensive utilization of the country's industrial's potential in order to advance agriculture and further improve the well-being of the people. It has entered solidly into the lives of the kolkhozes and sovkhozes and actively assists agricultural workers in their struggle for large crops and increased effectiveness and advanced science of farming.

Under the Tenth Five-Year Plan the aviators provided for successful fulfillment of the planned assignments and treated 450 million hectares of agricultural land from the air. There is a tendency for the proportion of chemical work done by aviation to increase and by 1980 it amounted to about 40 percent of the overall volume of work for applying chemicals in agriculture.

Distinguished by high productivity, maneuverability and universality, agricultural aviation provides for conducting aviation chemical work at the best agrotechnical time periods. The importance of this work has to do with the possibility of performing regardless of the condition of the soil, the stage of vegetation of the plants and the relief of the area, without disturbing the structure of the soil or damaging the plants. In terms of economic effectiveness, for many kinds of work airplanes and helicopters have a significant advantage over modern ground machines that are intended for applying toxic chemicals. Replacing ground technical equipment with aviation on just 1 million hectares relieves 1,300-1,600 workers and 1,000-1,200 tractors of the task of field work for applying mineral fertilizers during the busy periods on the farms, and when it is used to apply herbicides and other means of plant protection it relieves 5,300-6,800 workers and 3,300 tractors during a season.

The most widespread have been ultra low volume spraying (UMO) with 2.4D herbicide for fighting against weeds on areas planted in winter and spring wheat and rice, using centrifugal liquid sprayers with AN-2 aircraft, and top dressing of spring spike crops with liquid nitrogen fertilizers which provide for an additional yield of grain of spring wheat of up to 3.3 quintals per hectare and barley--up to 3.9 quintals per hectare, and the grain of the wheat has an increased content of protein and gluten.

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Agricultural aviation plays a large role in cotton growing. The cotton growing republics successfully fulfilled the assignments of the Tenth Five-Year Plan for the sale of cotton. In short periods of time agricultural aviation fully satisfied the needs of the agricultural workers for aviation work to defoliate the cotton plants. In order to increase the productivity of cotton they have developed: new technology for spraying the cotton with a chlorocholinechloride preparation (TUR) for chemical removal of the top foliage of the cotton plants, which provides increased productivity and makes it unnecessary to use manual labor or mechanical removal of the top foliage; technology for air application of the TsAKS defoliant and a mixture of it and magnesium chlorate, which provides for replacing the highly toxic butiphos defoliant, which changes the time periods for the beginning of defoliation by 8-10 days, considerably reduces the degree of pollution of the environment, doubles the productivity of the aircraft, and reduces the total national economic outlays on the treatment of one hectare of agricultural land; technology for the utilization of the biological preparation dendrobacilline for using aviation to fight against pests of cotton, which makes it possible to reduce pollution of the environment with toxic chemicals and improves the sanitary and hygienic conditions for the work of the people engaged in tending the cotton plants.

In order to accelerate the solution to the feed problem we are increasingly using technology for air top dressing of corn cultivated for silage with a solution of urea in the phase of milky and milky-waxy ripeness, which increases the protein content in the silage mass. In the practice of aviation-chemical work we are more and more extensively utilizing technology for air planting of grain spike crops, rice, and seeds of grass mixtures, which will be considerably more developed in the future.

The development and effectiveness of aviation chemical work, like in air transportation as a whole, depends to a decisive degree on the level of planning work. Methods of planning the use of aviation in the national economy should be formed in close connection with the establishment and development of methods of planning of the country's economic and social development.

In the modern period, which is characterized by an orientation of economic development toward intensiveness of management, the demands on the level of planning work are increasing very rapidly. Therefore the arrears that have accumulated in recent years in the methods of planning the appliation of aviation in the national economy, whose effectiveness is evaluated by the basic indicator of flight hours (to an An-2 aircraft) have become especially noticeable.

We are speaking about ensuring efficient and effective utilization of aircraft and helicopters for aviation chemical work and fully satisfying the needs of agriculture for aviation service, relying mainly on the intensive factor of management.

The task set in the Main Directions for the Economic and Social Development of the USSR During 1981-1985 and the Period Up to 1990 to increase the role of the agrochemical service in agriculture and its responsibility for effective application of mineral fertilizers and chemical means of plant protection places high demands on the agricultural aviation staff and its agrotechnical specifications and parameters.

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An important stage in the chemization of agriculture and the development of scientific and technical progress was the creation of the All-Union Production Scientific Association for Agrochemical Service for Agriculture. At the present time this specialized service has established business ties with kolkhozes and sovkhozes and civil aviation enterprises and entered on a course toward development of the material and technical base and the creation of complexes for chemization as well as the introduction of the scientific achievements and the experience of the leading enterprises.

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TILLING AND CROPPING TECHNOLOGY

EFFECTIVENESS OF AVIATION-CHEMICAL WORK IN TURKMENISTAN

Ashkhabad SEL'SKOYE KHOZYAYSTVO TURKMENISTANA in Russian No 1, Jan 82 pp 32-33

/Article by V. Kurilo, member of board and chief of Administration for Use of Aviation in the National Economy of the Ministry of Civil Aviation: "Effectiveness of Aviation-Chemical Work"/

/Text/ The 26th CPSU Congress outlined a program for further improving the welfare of Soviet people based upon stable and progressive development of the national economy, accelerated scientific-technical progress and the conversion of the economy over to an intensive path of development, more rational use of the country's production potential, maximum economies in the use of all types of resources and improvements in the quality of work.

With regard to raising the productivity and stability of farming, more and more importance is being attached to the use of chemical processes and also to the skilful use of organic and mineral fertilizers, plant protection agents and growth stimulators.

In connection with the use of chemical processes in agriculture, an important role is being played by aviation-chemical operations -- one of the principal types of aviation use in behalf of the country's national economy.

At the present time, approximately 40 percent of the overall volume of chemical work is being carried out with the aid of aviation. Such operations as applying an early spring top dressing to grain crops, the defoliation of cotton and the treatment of rice plantings are being carried out only by aviation. The proportion of work being carried out, using the aviation method, against certain types of grain crop pests is high and on the whole it amounts to 54.6 percent and against the chinch bug and corn weevils -- 81 percent and against cotton pests -- 52.8 percent.

The greatest proportion of aviation treatments has been reached in the Kazakh SSR -- and for aviation-chemical work against weeds -- 90.1 percent. More than one half of the overall volume of chemical work in the Uzbek, Turkmen and Azerbaijan SSR's is being carried out by aviation. The zone of activity for agricultural aviation embraces the entire country, including the most remote regions. Each year, more than 3,000 aircraft and helicopters of agricultural aviation carry our agricultural work.

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The aviators are making a worthy contribution by assisting the rural workers in fulfilling their socialist obligations. Jointly with the agricultural organs, measures are being carried out aimed at improving organization and technology, raising the effectiveness and quality of the aviation-chemical work and improving the culture of farming and the intensity of use of the aircraft and helicopters.

The socialist competition among the collectives of enterprises of civil aviation and Soyuzsel'khozkhimiya organizations is being employed on an extensive scale.

Agricultural aviation is making a great contribution towards the cultivation of grain, cotton and other crops.

The USSR Ministries of Aviation and Agriculture are carrying out an entier complex of measures aimed at improving the organization and technology of aviation-chemical operations, raising the effectiveness of use of aircraft and improving the quality of applications of mineral fertilizers and plant protective agents.

The established practice of the two ministries with regard to the preparation of joint plans, measures, normative documents and business-like relationships, when solving operational problems, is viewed as a progressive method of economic management and one which makes it possible to achieve high final results.

During the past few years, stronger business-like relationships have been established with the organizations of Soyuzsel'khozkhimiya in the various areas, with the kolkhozes and sovkhozes and with local party and Soviet organs.

The convening of joint production-methodological conferences on exchanging leading experience in the organization and carrying out of aviation-chemical work is being practiced on a large scale.

Republic, kray, oblast and rayon operational staffs are created for the period in which the aviation work is to be carried out, for the purpose of organizing efficient use of the chemical resources, aircraft and helicopters. Operational plans and schedules are prepared for each aircraft and helicopter.

Measures are being undertaken aimed at maintaining the flight runways at kolkhozes and sovkhozes in good operating condition and also for creating, on the basis of inter-farm cooperation, new flight runways for the kolkhoz and sovkhoz chemical stations. This is a promising long-range trend. The carrying out of aviation-chemical work through a system of chemical stations makes it possible to lower labor expenditures by one and a half times and to almost double the productivity of the aircraft flights. This is borne out by aviation work carried out in the north Caucasus, the Volga region, the Ukraine and in other regions of the country.

During the course of organizing the construction of flight runways, we simultaneously devote a great amount of attention to the selection of dirt airfields. A proper combination for the use of these two types of airfields serves to raise the productivity of the flights while lowering the costs for the aviation work.

Support bases of agricultural aviation are organized for the purpose of providing operational management for the work of the crews, technical servicing for the

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aircraft and helicopters in the regions where the work is carried out and also for solving problems concerned with flight safety. The work of such bases makes it possible to reduce the amount of non-productive time during flights and also idle time caused by organizational-technical factors.

The Ministry of Civil Aviation is devoting a great amount of attention to introducing scientific recommendations and leading experience into production operations. Each year, jointly with the USSR Ministry of Agriculture, a plan is prepared and implemented for introducing technical processes and methods for carrying out the aviation-chemical work into production operations.

Great importance is being attached to the extensive introduction into operations of such technological processes as foliar top dressings of mineral fertilizers, the use of herbicides and pesticides for combating the weeds and pests of agricultural crops, use of the TUR preparation for combating lodging in agricultural crops, dessication and defoliation of plants and the aerial sowing of rice, wheat, other grain crops and grass seed.

In 1980, on an area of 26.5 million hectares, the enterprises and subunits of MGA /Ministry of Civil Aviation/ employed new flight regimes and progressive technologies for the carrying out of aviation-chemical operations, they introduced new types of work and they continued to introduce wide-swath sprayers into operations. This was all aimed at raising the effectiveness of use of the aviation equipment and improving the quality of the aviation operations.

The small liquid expenditure norms associated with the ultra-low-volume method of spraying constitute great reserves for raising the productivity of the flights and lowering the cost of the aviation-chemical operations, both for aviation and for agriculture. In 1980, our enterprises treated approximately 1.4 million hectares using the ultra-low-volume method. The new method makes it possible to raise the productivity of the flights by a factor of 2-2.5. This aviation method of spraying was employed for combating the weeds of rice and wheat and for protecting the crops against the agricultural pests.

At the present time, one of the chief tasks confronting civil aviation is that of uncovering and utilizing all available reserves for accelerating scientific-technical progress in the field of aviation-chemical work.

Some measures have already been implemented in this regard.

Work is being carried out in connection with creating new and more improved models of agricultural and specialized on-board equipment for the aircraft and helicopters. Commencing in 1978, the An-2 aircraft were equipped with more productive wide-swath dusters for spreading mineral fertilizers. Experimental models were developed for more improved liquid sprayers for low volume and ultra-low-volume spraying. Centrifugal sprayers are being intorduced into operations for the An-2 aircraft. These sprayers have proved their worth during the carrying out of aviation work, using the method of ultra-low volume spraying against weeds on wheat fields in Kazakhstan. A centrifugal spreader has been developed for the Ka-26 helicopter.

An RVP-1M instrument for the An-2U aircraft -- for recording the number of landings and the operational time of an engine both on the ground and when airborne -- has been developed and is presently in the stage of being introduced.

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A signal indicator has been developed for indicating the maximum turns and minimum flight speed for the An-2 aircraft. Use of the MI-8 helicopter for aviation-chemical work, for which agricultural equipment is being developed, is of definite economic interest.

In improving the technological process of aviation work involving the use of toxic chemicals, an important problem continues to be that of preventing the chemicals from spreading beyond the area being treated and especially when use is being made of the ultra-low-volume method of spraying.

The agricultural organs are now devoting more attention to improving the working and leisure conditions for the flight and technical personnel responsible for carrying out the aviation-chemical work.

A socialist competition among the crews of agricultural aviation is being employed on an extensive scale in the interest of achieving timely and high quality fulfillment of the aviation-chemical work and furnishing effective assistance to the agricultural workers.

Socialist collaboration between the aviation enterprises and farms, based upon a mutual agreement, is producing positive results. The greatest improvement in this form of relationship between aviators and agricultural workers was achieved in the north Caucasus.

During the Eleventh Five-Year Plan, the aviators must solve great tasks associated with providing aviation support for agriculture. The state plan for agriculture for the 1981-1985 period calls for 482 million hectares to be treated. Specific measures must be implemented aimed at improving the organization of work, reducing unproductive flights, eliminating aircraft idle time, lowering the totality of transport expenditures and obtaining a maximum return from each flight and from each minute of flight time. Together with raising the volumes and expanding the sphere of use of aviation in the national economy, priority attention must be given today to those tasks concerned with raising the effectiveness of use of the helicopters and aircraft.

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TILLING AND CROPPING TECHNOLOGY

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ROLE OF SORGHUM CULTIVATION REVIEWED

Cultivation on Irrigated Land

Moscow GIDROTEKHNIKA I MELIORATSIYA in Russian No 2, Feb 82 pp 57-58

/Article by V.I. Ostapov, candidate of agricultural sciences and director of the Ukrainian Scientific Research Institute of Irrigation Farming, N.V. Belous, candidate of agricultural sciences and senior scientific worker and L.F. Mazka, candidate of agricultural sciences and head of the Department of Irrigation at the Ukrainian Scientific Research Institute of Irrigation Farming: "Technology for Cultivating Grain Sorghum Under Irrigation/

/Text/ For increasing grain production in the steppe zone of the Ukraine, a great role can be played by the cultivation of grain sorghum on irrigated land together with corn.

Owing to its biological characteristics, sorghum is well adapted to the conditions of a dry climate, it is not very demanding with regard to soil, it endures soil salinization rather well, it is thrifty in its consumption of soil moisture (20-25 percent less than corn) and it responds very well to irrigation. The degree to which sorghum responds to irrigation is borne out by data obtained from tests carried out at the UkrNIIOZ /Ukrainskiy nauchno-issledovatel'skiy institut oroshayemogo zemledeliya; Ukrainian Scientific Research Institute of Irrigation Farming/, during which the grain yields obtained from the best hybrids, under irrigation conditions and with an entire complex of agrotechnical measures being carried out, reached 9.5-11 tons per hectare (without irrigation -- 2-2.8 tons per hectare.

For the very first time in agricultural production practice in Khersonskaya Oblast, grain sorghum was sown on a comparatively small irrigated tract of land in 1972. Despite the fact that the technology for cultivating this crop under irrigation conditions was still new to the production workers and not sufficiently mastered, the grain yield obtained using the Stepnoy-5 regionalized hybrid turned out to be rather high. Thus, at the Serp i Molot Kolkhoz in Kalanchakskiy Rayon, following four waterings using an irrigation norm of 3,200 cubic meters per hectare and an application of 80 kilograms of active agent of phosphorus and 70 kilograms of active agent of nitrogen, the sorghum grain yield obtained from an area of 20 hectares amounted to 6.5 tons per hectare; the labor expenditures for the production of 1 ton of grain did not exceed 0.9 man-hours and the production cost was 15.6 rubles per ton. An even higher yield was obtained from this crop at the Komsomol'skiy Experimental-Demonstration Sovkhoz in Skadovskiy Rayon -- 7.9 tons of grain per hectare.

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Research was carried out over a period of 4 years for the purpose of studying the morphobiological characteristics of sorghum grain hybrids, their suitability for mechanized harvesting, the effectiveness of cultivation under irrigation conditions and also the principal agrotechnical practices for cultivating this crop on irrigated lands of the UkrNIIOZ.

The experiments were carried out on dark chestnut weakly alkaline soils having a humus layer of 30-35 cm. The climatic characteristics of the years in which the experiments were carried out varied from damp and cool to dry and hot. Since the duration of the period marked by an average daily temperature of -10° Centigrade is 150 days in the southern Ukraine, highly productive sorghum grain hybrids of the mid-season to late group having a growing season of 130-136 days have proven to be acceptable for cultivation in this zone. From a large number of hybrids, the most promising and highly productive hybrids bred by VIR /All-Union Scientific Research Institute of Plant Growing/ and the All-Union Scientific Research Institute of Corn were singled out: Stepnoy-5, VIR-37, VIR-38, VIR-40 and KOS-1 and some others. These hybrids are uniform in terms of the height and ripening of the panicles and, in this regard, suitable for direct combining. The average grain yield for these hybrids, during the years in which the experiments were conducted, fluctuated from 7.5 to 11.4 tons per hectare depending upon the weather conditions and the type of hybrid used.

The studies revealed that sorghum responds very well to applications of fertilizer. With deep fall plowing, 100-120 kilograms of active agent of phosphorus and 70-80 kilograms of active agent of nitrogen should be applied per hectare.

The best sowing method for sorghum grain is that of single grain sowing, with an inter-row spacing of 70 centimeters. This method ensures uniform placement of the plants in a drill row and better exposure to light for them. When use is made of the single grain sowing method, the optimum density for a stand of plants is 200,000 per hectare. If the plantings are crowded to a density of up to 250,000-300,000 plants per hectare, the grain yield decreases noticeably (from 12 to 9 tons per hectare).

The use of triazine herbicides (in a dosage of 2 kilograms of active agent per hectare) prior to pre-sowing cultivation is most effective for combating weeds in sorghum plantings. During the growing season, the herbicide 2.4D is applied (in a dosage of 1 kilogram of active agent per hectare) during the phase of 3-5 leaves.

The tending of the plantings includes 3-4 inter-row loosenings of the soil: the first to a depth of 8-10 centimeters and the subsequent ones to a further depth of 2-3 centimeters. Simultaneous with the inter-row cultivations and irrigation ridging and prior to the first foliar watering, a nitrogen fertilizer top dressing is applied to the plants at the rate of 20-30 kilograms of active agent per hectare. For combating aphids, which cause considerable harm to the growth, development and yield of sorghum, the plantings are sprayed with 0.2 percent emulsions of metaphos and rogor.

The water consumption of irrigated sorghum in the southern Ukraine fluctuates from 2,571 to 4,630 cubic meters per hectare, depending upon the weather conditions during the growing season, especially humidity and thermal factors, which raise the need for carrying out more waterings. Sorghum responds very well to waterings

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begun during the tillering phase, the heading of the panicles and the forming of the grain. The principal watering method -- spraying. Prior to spraying, the ridging of interrupted furrows and slit-furrows in each inter-row spacing is effective; it reduces water losses through evaporation and runoff. On tracts having minor slopes the sorghum plantings are watered 2-5 times during the growing season using an irrigation norm of 600-650 cubic meters per hectare and for greater slopes the number of waterings is increased to 3-7, with a watering norm of 400-450 cubic meters per hectare. In both instances, the moisture content in the 0.7 meter soil layer is maintained at the 70-80 percent NV /minimum moisture capacity/ (see Table).

Irrigation Regime and Cropping Power of VIR-37 Sorghum Grain Hybrid
(average for years in which experiments conducted)

Waterings for a moisture content in 0.7 meter layer of soil, % NV	Number of waterings	Watering norm, m^3 per hectare	Irrigation norm m^3 per hectare	Total water consump., m^3 per hectare	Coeffic. of water consumpt., m^3 per hectare	Grain yield, tons per hectare
Without watering	-	-	-	1859..2899	597..1575	2.75
50	1.....2	1050	1050..2100	2571..3860	453..869	5.03
60	1.....3	850	850..2550	3291..3986	345..500	8.62
70	2.....5	650	1300..3250	3747..4630	355..474	9.99
80	3.....7	450	1350..3150	3727..4249	381..427	10.16

It is apparent from the data in the Table that the maximum sorghum yield is obtained when the moisture content of the soil is maintained at the 80 percent NV level.

The harvesting of sorghum grain is carried out during the phase of waxy or complete ripeness of the grain, using direct combining and with the header of the SK-4 combine raised to the cutting height for the panicles and the speed of rotation of the drum -- 550-600 revolutions per minute. The sorghum harvested in this manner is ensiled in cement trenches or processed for flour, which thereafter is used in the preparation of granules.

Although grain sorghum under irrigation is a new crop, nevertheless the areas being set aside for it on farms in Khersonskaya Oblast are increasing with each passing year.

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New Sorghum Varieties

Tashkent SEL'SKOYE KHOZYAYSTVO UZBEKISTANA in Russian No 11, Nov 81 p 32

/Article by L. Kryzhinskaya and T. Tursunbayev, scientific workers at UzNIIZh: "New Sorghum Varieties"/

/Text/ In the breeding and seed production for forage crops at UzNIISh /Uzbek Scientific Research Institute of Animal Husbandry/, work has been underway for many years in connection with the creation of new and highly productive varieties of sorghum (Joughara), which can be employed for a variety of purposes: for cultivation for silage or grain.

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By crossing individual geographic forms obtained from the international collection with local varieties of Joughara, we obtained hybrid material suitable for various purposes.

As a result of crossing a specimen of Khigeri Dwarf with the Olty Oylik variety and subsequent selection over a period of many years, a new variety for post-harvest sowings was developed -- Uzbekskoye 5 (authors S.K. Kadamov, I.V. Massino and A.V. Kryzhinskaya). The plants of the new variety are uniform and they have panicles which stand up straight on elongated stalks and white bare grain. The variety is resistant against lodging and diseases. The height of its plants -- 165-173 centimeters and its growing season from sowing to complete grain ripeness -- 113-115 days.

During competitive strain testing carried out during the 1976-1980 period, the variety Uzbekskoye 5 surpassed the standard -- the early-ripening Kokandskoye Red variety -- in terms of all indicators: height of plants -- by 39.6 centimeters, length of panicle -- by 8.6 centimeters, width -- by 1.0 centimeter, grain yield during thrashing -- by 1.2 percent. The increase in grain yield amounted to 18.3 quintals per hectare.

In terms of its chemical structure (crude protein, cellulose, BEV, ash), the grain of the new variety differs markedly from the standard. For example, it contains 1.1-1.2 percent cellulose, or 2-2.5 times less than that found in the grain of local and selected varieties. And this is of great importance with regard to raising the food value and assimilability of feed in a ration, the composition of which will include the grain of this new variety.

In 1976, under production conditions at the Malik Sovkhoz in Syrdar'inskaya Oblast, the new variety proved its worth in post-harvest sowings -- the grain yield amounted to 43.9 quintals per hectare,or 6.5 quintals per hectare higher than the indicator for the standard.

Tests conducted at the Karakul GSU /state strain testing station/ (1977-1979) confirmed the superiority of the new variety over the standard in connection with post-harvest sowings. Based upon the results of these tests, Uzbekskoye 5 has been regionalized for post-harvest sowings on irrigated land in Bukharskaya and Kashkadar'inskaya Oblasts.

As a result of crossing a specimen of Afrikanskiy Buryy (K-1814) with the Olty Oylik variety and the selection of a hybrid population, the Uzbekskoye 18 multi-purpose variety was created (authors S.K. Kadamov, I.V. Massino, T. Tursunbayev).

The variety has a strong, succulent and sugary stalk and an upright white grain panicle. The plants attain a height of 235.5 centimeters and they are resistant against lodging, thus making it possible for the fodder to be harvested by combines. The growing season from seedling to the stage of waxy ripeness of the grain is 109 days and from seedling to complete ripeness of the grain -- 142 days. It differs from the Oranzhevoye 160 and Olty Oylik standards in terms of its late ripening (by 10-19 and 20-23 days respectively), large height of plants -- by 76.9 - 151.8 quintals per hectare, yield of dry substance -- by 40.3-49.9 quintals per hectare, grain yield -- by 4.26-27.72 quintals per hectare. In terms of feed unit yield, it surpasses the standard by 37.10-44.21 quintals per hectare, digestible protein -- by 0.08-1.26 quintals per hectare. In terms of the content of fat, cellulose,

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non-nitrogen extractive substances and ash, the new variety has intermediate indicators between the sugar and bare sorghum varieties.

According to data obtained from a test carried out at the Chimbayskiy GSU (1977-1979), the new variety produced 999.5 quintals of fodder per hectare, whereas the best regionalized varieties -- Chilyaki local improved and Katta Bosh -- produced only 730.9 and 702 quintals per hectare respectively.

The grain yield for the Uzbekskoye 18 variety was 73.8 quintals per hectare, for the Chilyaki local improved -- 94.8 quintals per hectare and for the Katta Bosh variety -- 90.9 quintals per hectare.

The Uzbekskoye 18 variety has been regionalized in the Karakalpakskaya ASSR.

Thus, varieties bred as a result of extended selection work are of considerable interest and can be employed extensively on the fodder fields of Uzbekistan.

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TILLING AND CROPPING TECHNOLOGY

EXTENSIVE USE OF AIRCRAFT IN AGRICULTURAL WORK FORESEEN

Moscow SEL'SKOYE KHOZYAYSTVO NECHERNOZEM'YA in Russian No 3, Mar 82 p 34

/Article by B. Bychkov: "Wings Over the Field"/

/Excerpt/ Statement of the USSR Ministry of Civil Aviation. About 40 percent of the work on the chemicalization of agriculture is now performed from the air. During the past 5-year period state income from the use of aviation in rural areas averaged more than 1.5 billion rubles annually. Ultralow-volume spraying was widely used in the control of mass pests of field crops in 1981.

V. Kurilo, member of the board of the USSR Ministry of Civil Aviation, chief of the Administration for the Use of Aviation in the National Economy, comments on the prospects for the use of aviation in the country's agriculture:

The solution of the food problem brought forth by the 26th CPSU Congress and the dynamic development of all the directions in agricultural production require an even more active participation of civil aviation in a rise in the yield of fields and productivity of animal husbandry.

On kolkhozes and sovkhozes during the 11th Five-Year Plan 482 million hectares of agricultural land will have to be treated by aerial chemical methods. This is approximately 18 million hectares more than during the past 5 years. Traditional types of field treatment, which proved to be successful, such as the application of mineral fertilizers, protection of crops against pests and diseases, control of weedy vegetation and plant defoliation, will account for the main volume of work. Such advanced technological methods and types of field treatment as foliar top-dressing of grain crops with mineral fertilizers in combination with herbicides and pesticides, application of chlorocholine chloride, which prevents the lodging of grain crops, desiccation and defoliation of sunflower seeds, potatoes and lupin and aerial sowing of fodder grass seeds will also be introduced into practice.

The construction of runways, including with a hard surface, on kolkhozes and sovkhozes will be carried out at accelerated rates and on a larger scale than before. A total of 1,248 new airfields--850 in the Russian Federation alone (the majority--about 600--in the nonchernozem zone)--will be added to existing agricultural airfields during the five-year plan.

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In contrast to the past five-year plan aerial chemical work will be carried out everywhere in close contact with the All-Union Scientific Production Association for Agrochemical Services to Agriculture. This will make it possible to lower labor expenditures to two-thirds and to almost double the seasonal output of aircraft. The organization of so-called support bases designed for a group placement and labor intensive maintenance of aircraft will become further widespread in regions of mass aerial chemical work. Following the experience of past years the maneuvering of the fleet of aircraft and helicopters will be practised. This makes it possible to more efficiently use aviation equipment and to perform work in a better way and in a shorter time.

The useful initiative of agricultural aviators--socialist competition on the basis of cooperation agreements between aviators and the All-Union Scientific Production Association for Agrochemical Services to Agriculture and between kolkhozes and sovkhozes--is also becoming more and more widespread. The fulfillment of these agreements makes it possible to carry out the full set of aerial chemical operations on a high organizational level and in an efficient and high-quality manner.

...Aircraft over the field--this has become a customary feature of the present rural landscape and not even because people have begun to live better. Sober cost accounting is the main thing here. Any manager now knows well that outlays invested in aerial chemical work will always be repaid generously.

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TILLING AND CROPPING TECHNOLOGY

BRIEFS

AN-28 FOR AGRICULTURAL WORK--During this five-year plan the fleet of winged machines will also be replenished with the multipurpose short take-off and landing AN-28 aircraft. As compared with the An-2 it has greater safety (two engines instead of one), a cruising speed of 350 km per hour, improved comfort and a large capacity--17 instead of 12 seats. In 3½ decades the design bureau of academician O. K. Antonov, hero of socialist labor, winner of the Lenin Prize, deputy of the USSR Supreme Soviet, gave many winged machines a start in life. During this five-year plan the An-2 will also be replaced with the An-3 aircraft. It has a more powerful turboprop engine. Productivity in agricultural work will be increased 1.5-fold and the cost of aerial chemical work will be reduced by 25 to 30 percent. However, let us turn back to the An-28, A set of the latest pilot-navigation and radio communication equipment ensuring high flight safety day and night is used in the aircraft. /Text/ /Moscow IZVESTIYA in Russian 19 Feb 82 p 2/ 11,439

AERIAL FERTILIZER APPLICATION--Minsk, 18 Mar--Aircraft over fields--this means that spring has come. The An-2 crew was the first in Soligorskiy Rayon to begin the top-dressing of winter crops on the Kolkhoz imeni Chkalov. Two other aircraft apply mineral fertilizers on the Kolkhoz imeni Krasnoznamennyy in the Belorussian Military District and on the 10 Let BSSR Sovkhoz in Lyubanskiy Rayon. Agricultural aviation pilots service 146 kolkhozes and sovkhozes in Minskaya Oblast. They now have to cultivate about 800,000 hectares of arable land and meadow and pasture areas. A total of 38 aircraft and 12 helicopters of the United Minsk Aviation Detachment, as well as 30 aircraft from the West Siberian and Ukrainian Administration of Civil Aviation, will perform this volume of work. A special operational headquarters was established in the oblast for a better use of aviation equipment in agricultural work. /By V. Legan'kov/ /Text/ /Moscow SEL'SKAYA ZHIZN' in Russian 19 Mar 82 p 1/ 11,439

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